

State/Industry Ambient Monitoring Network

Air Quality Report

4th Quarter 2001

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North Dakota Department of Health

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SECTION ONE

DISCUSSION OF MONITORING RESULTS

Sulfur Dioxide (SO₂)

There were no exceedances of the state or federal standards during the quarter. The maximum 1-hour concentration was 94 ppb on November 7 at Mandan - SPM; the maximum 3-hour concentration was 77 ppb on November 7 at Mandan - SPM; and, the maximum 24-hour concentration was 29 ppb on at Mandan - SPM on December 18. All sites, except Amerada Hess - Tioga #1, achieved at least an 80% data recovery for the period.

Amerada Hess - Tioga #1 failed to achieve 80% data recovery due to collection errors caused by a site operator.

The Hannover site was restored to operation after the site was destroyed by a wind storm on June 25.

Sulfur Dioxide (SO₂) 5-Minute Average

The maximum 5-minute concentration was 199 ppb on October 24 at Mandan - SPM.

The Hannover site was restored to operation after the site was destroyed by a wind storm on June 25.

Ozone (O₃)

There was no exceedance of the ozone standard during the quarter. The maximum observed 1-hour concentration was 50 ppb on October 2 at Fargo NW. The 4th highest 8-hour concentration was 43 ppb on October 2 at TRNP - SU. All sites achieved at least an 80% data recovery for the period operated.

The Hannover site was restored to operation after the site was destroyed by a wind storm on June 25.

Nitrogen Dioxide (NO₂)

The maximum 1-hour concentration observed was 84 ppb on November 17 at DGC #17. All sites achieved at least an 80% data recovery for the period operated.

The Hannover site was restored to operation after the site was destroyed by a wind storm on June 25.

Ammonia (NH₃)

The maximum 1-hour average was 91.3 ppb on November 12 at Beulah - North. An 80% data recovery was achieved for the period operated.

The data will be used as part of the ambient data input used by the newer dispersion models.

Inhalable Continuous PM_{2.5} Particulates

The maximum 1-hour concentration was 75.4 µg/m³ on November 27 at Fargo NW; the maximum 24-hour concentration was 16.4 µg/m³ on November 27 at Fargo NW. All sites achieved at least an 80% data recovery for the period operated..

Inhalable FRM PM_{2.5} Particulates

The maximum 24-hour average concentration was 23.9 µg/m³ on October 31 at Fargo NW. All sites achieved at least an 80% data recovery for the period.

Inhalable PM₁₀ Particulates

There was no exceedance of the 24-hour standard during the quarter. The maximum 24-hour average concentration was 39.0 µg/m³ on October 4 at Bismarck Residential. An 80% data recovery was achieved for the period operated.

Inhalable PM₁₀ Sulfates (SO₄)

Sulfate analysis was terminated effective July 1 when the Department changed to different samplers and a contract laboratory. Related to this change is the addition of speciation samplers to the network. Since the speciation samplers also provide sulfates, as well as 59 other components. All 60 speciation components are available in the EPA-AIRS AQS database.

SECTION TWO

AMBIENT AIR QUALITY DATA

SUMMARIES

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Sulfur Dioxide (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	1 - HOUR		M A X I M A		24 - HOUR		ARITH MEAN	1HR #>273	24HR #>99	% >MDV
				1ST	2ND	1ST	2ND	1ST	2ND				
				MM/DD/HH	MM/DD/HH	MM/DD/HH	MM/DD/HH	MM/DD	MM/DD				
Amerada Hess - Tioga #1	2001	OCT-DEC	1709 ***	57 11/19/22	46 12/16/18	30 11/19/23	29 11/08/11	7 11/19	6 11/08	1.6			12.3
Amerada Hess - Tioga #3	2001	OCT-DEC	2185	81 11/18/09	70 10/10/09	50 11/18/11	48 12/26/11	18 12/26	15 11/07	3.1			23.6
Bear Paw - MGP #3	2001	OCT-DEC	2192	12 12/12/08	11 12/12/06	11 12/12/08	6 12/12/11	3 12/12	2 12/31	1.2			10.7
Bear Paw - MGP #5	2001	OCT-DEC	2190	14 11/28/19	12 10/01/08	9 11/28/20	9 12/12/08	3 12/12	2 10/01	1.1			7.5
Beulah - North	2001	OCT-DEC	2192	25 10/01/15	20 10/02/08	18 10/01/17	16 11/11/14	4 10/01	4 11/11	1.4			13.9
DGC #12	2001	OCT-DEC	2194	29 10/01/16	25 10/01/15	26 10/01/17	17 11/11/14	9 10/14	6 10/13	1.8			23.6
DGC #14	2001	OCT-DEC	2195	34 11/08/22	28 11/19/11	19 11/08/23	16 11/19/11	5 11/02	4 12/25	1.7			18.8
DGC #16	2001	OCT-DEC	2194	29 10/06/19	28 11/10/10	16 11/10/11	15 10/06/20	5 10/07	5 12/10	1.5			17.0
DGC #17	2001	OCT-DEC	2193	28 10/01/21	20 11/22/00	17 10/01/23	11 11/22/02	5 10/01	5 11/22	1.3			9.4
Dunn Center	2001	OCT-DEC	2187	7 11/11/14	6 11/06/16	6 11/06/17	5 12/12/02	2 10/01	2 12/12	1.1			6.0
Fargo NW	2001	OCT-DEC	2196	8 12/31/15	7 12/31/14	4 11/11/20	4 12/31/17	2 12/31	1 10/01	1.0			1.7
Hannover	2001	OCT-DEC	1450	44 12/04/13	35 11/12/09	29 12/04/14	23 11/12/11	5 11/12	5 12/04	1.8			20.6
Mandan - SPM	2001	OCT-DEC	2195	94 11/07/19	90 12/26/12	77 11/07/20	76 12/26/14	29 12/18	28 12/26	6.2			45.6
Mandan NW - SPM	2001	OCT-DEC	2196	85 12/14/18	81 10/22/03	74 12/14/20	39 10/22/05	15 10/07	14 12/14	3.7			48.0

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : SULFUR DIOXIDE (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	1 - HOUR		M A X I M A		24 - HOUR		ARITH MEAN	1HR #>273	24HR #>99	% >MDV
				1ST	2ND	1ST	2ND	1ST	2ND				
				MM/DD/HH	MM/DD/HH	MM/DD/HH	MM/DD/HH	MM/DD	MM/DD				
TRNP - NU	2001	OCT-DEC	2186	9 10/01/10	7 10/01/11	6 10/01/11	6 12/11/14	2 10/01	2 12/30	1.0			4.9
TRNP - SU (Painted Canyon)	2001	OCT-DEC	2196	11 11/11/19	10 11/11/23	9 11/11/20	9 11/11/23	3 11/11	2 12/05	1.1			4.0
White Shield	2001	OCT-DEC	2190	23 11/28/10	12 11/28/11	13 11/28/11	10 12/15/17	4 11/28	4 12/25	1.2			9.5

The maximum 1-hour concentration is 94 ppb at Mandan - SPM on 11/07/19
The maximum 3-hour concentration is 77 ppb at Mandan - SPM on 11/07/20
The maximum 24-hour concentration is 29 ppb at Mandan - SPM on 12/18

* The air quality standards are:

STATE Standards -

- 1) 273 ppb maximum 1-hour average concentration.
- 2) 99 ppb maximum 24-hour average concentration.
- 3) 23 ppb maximum annual arithmetic mean concentration.

FEDERAL Standards -

- 1) 500 ppb maximum 3-hour concentration not to be exceeded more than once per year.
- 2) 140 ppb maximum 24-hour concentration not to be exceeded more than once per year.
- 3) 30 ppb annual arithmetic mean.

*** Less than 80% of the possible samples (data) were collected.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Sulfur Dioxide 5-Minute Averages (ppb)

LOCATION	YEAR	PERIOD	OBS	5 - M I N U T E M A X I M A						# HOURS >600	% >MDV
				1ST	DATE	2ND	DATE	3RD	DATE		
					MM/DD/HH		MM/DD/HH		MM/DD/HH		
Bear Paw - MGP #3	2001	OCT-DEC	2192	16	10/10/08	16	12/27/06	15	12/23/11	0	16.9
Bear Paw - MGP #5	2001	OCT-DEC	2190	39	10/01/08	28	12/03/03	23	11/28/19	0	17.4
Beulah - North	2001	OCT-DEC	2192	37	10/02/08	36	10/11/11	35	11/11/12	0	22.8
Dunn Center	2001	OCT-DEC	2187	11	11/10/09	9	11/06/13	9	11/11/13	0	11.8
Fargo NW	2001	OCT-DEC	2196	11	12/31/14	11	12/31/15	10	11/11/19	0	4.7
Hannover	2001	OCT-DEC	1450	74	11/12/09	71	12/04/13	66	11/23/12	0	29.4
Mandan - SPM	2001	OCT-DEC	2195	199	10/24/14	152	10/04/13	146	10/17/19	0	59.3
Mandan NW - SPM	2001	OCT-DEC	2196	144	12/21/08	139	10/22/03	131	11/12/14	0	63.0
TRNP - NU	2001	OCT-DEC	2186	12	10/01/09	12	10/01/10	10	10/01/11	0	8.4
TRNP - SU (Painted Canyon)	2001	OCT-DEC	2196	17	11/11/23	15	10/01/06	15	11/12/02	0	11.4

The maximum 5-minute concentration is 199 ppb at Mandan - SPM on 10/24/14

* No Standard is currently in effect:

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Ozone (PPB)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	1 - HOUR		M A X I M A		8 - HOUR		4TH	1HR #>120	8HR #>80
				1ST MM/DD/HH	2ND MM/DD/HH	1ST MM/DD/HH	2ND MM/DD/HH	3RD MM/DD/HH	4TH MM/DD/HH			
Beulah - North	2001	OCT-DEC	2191	49 10/08/14	48 10/08/13	44 10/08/09	36 10/08/10	36 10/08/08	36 10/08/11			
Dunn Center	2001	OCT-DEC	2192	49 10/08/10	49 10/08/11	46 10/08/08	39 10/08/09	39 10/08/07	39 10/08/10			
Fargo NW	2001	OCT-DEC	2196	50 10/02/13	48 10/01/14	44 10/01/09	36 10/01/10	36 10/01/08	36 10/02/09			
Hannover	2001	OCT-DEC	1454	42 11/14/04	41 11/13/13	40 11/14/00	36 11/13/23	36 11/13/22	36 11/13/21			
TRNP - NU	2001	OCT-DEC	2193	50 10/01/13	49 10/01/12	46 10/08/10	42 10/08/09	42 10/01/10	42 10/01/09			
TRNP - SU (Painted Canyon)	2001	OCT-DEC	2196	49 10/01/15	47 10/01/14	46 10/01/11	43 10/01/10	43 10/01/09	43 10/01/13			

The maximum 1-hour concentration is 50 ppb at Fargo NW on 10/02/13

The 4th highest 8-hour concentration is 43 ppb at TRNP - SU (Painted Canyon on 10/01/13

* The air quality standards for ozone are:

STATE - 120 ppb not to be exceeded more than once per year.

FEDERAL - Fourth highest daily maximum 8-hour averages for a 3-year period not to exceed 80 ppb.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Nitrogen Dioxide (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	M A X I M A 1 - HOUR		ARITH MEAN	% >MDV
				1ST	2ND		
				MM/DD/HH	MM/DD/HH		
Beulah - North	2001	OCT-DEC	2187	21 12/06/16	20 11/17/20	3.3	74.7
DGC #12	2001	OCT-DEC	2109	24 12/22/23	23 12/30/03	3.8	86.5
DGC #17	2001	OCT-DEC	2176	84 11/17/07	45 12/03/05	2.9	63.1
Dunn Center	2001	OCT-DEC	2177	15 12/04/20	13 10/23/10	1.6	32.5
Fargo NW	2001	OCT-DEC	2192	38 11/13/17	35 11/13/18	6.7	81.5
Hannover	2001	OCT-DEC	1446	27 12/06/18	26 12/06/19	3.1	73.9
TRNP - NU	2001	OCT-DEC	2178	7 11/30/16	7 12/20/18	1.4	27.0

The maximum 1-hour concentration is 84 ppb at DGC #17 on 11/17/07

* The air quality standards are:
STATE - 53 ppb maximum annual arithmetic mean.
FEDERAL - 53 ppb annual arithmetic mean.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Ammonia (ppb)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	M A X I M A					
				1ST	2ND	3RD	4TH	5TH	6TH
				MM/DD/HH	MM/DD/HH	MM/DD/HH	MM/DD/HH	MM/DD/HH	MM/DD/HH
Beulah - North	2001	OCT-DEC	2177	91.3 11/12/01	75.1 12/18/07	65.0 12/22/21	55.2 12/18/11	8.1 11/12/02	7.0 12/26/11

* No standard is currently in effect.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Inhalable Continuous PM_{2.5} (µg/m³)

COLLEMAN - AMUNDABLE CONDORADO PM2.5 (µg/m³)													
LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	1 - HOUR		M A X I M A		24 - HOUR			MEAN	1HR #>150	24HR #>65
				1ST	2ND	1ST	2ND	3RD	4TH				
				MM/DD/HH	MM/DD/HH	MM/DD	MM/DD	MM/DD	MM/DD				
Beulah - North	2001	OCT-DEC	2199	55.2 12/06/14	33.7 10/23/11	13.9 11/22	12.0 11/23	11.8 10/23	11.3 11/07	5.9			
Fargo NW	2001	OCT-DEC	1883	75.4 11/27/06	55.1 11/27/08	16.4 11/27	16.0 11/06	14.8 11/05	12.5 11/13	4.9			

The maximum 1-hour concentration is 75.4 µg/m³ at Fargo NW on 11/27/06
The highest 24-hour concentration is 16.4 µg/m³ at Fargo NW on 11/27

* The ambient air quality standards are:

FEDERAL Standards -

- 1) 24-hour: 3-year average of 98th percentiles not to exceed 65 µg/m³.
- 2) Annual: 3-year average not to exceed 15 µg/m³.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Inhalable FRM PM_{2.5} Particulates (µg/m³)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MIN	M A X I M A 24 - HOUR			ARITH MEAN	#> 65	AM>15	% >MDV
					1ST MM/DD	2ND MM/DD	3RD MM/DD				
Beulah - North	2001	OCT-DEC	15	1.3	16.1 12/15	11.8 12/21	5.4 11/21	4.2			86.6
Bismarck Residential	2001	OCT-DEC	31	1.8	21.6 11/12	16.5 10/31	15.8 11/30	6.8			96.7
Fargo NW	2001	OCT-DEC	31	0.6	23.9 10/31	23.0 11/06	19.4 12/15	8.3			96.7
Grand Forks - North	2001	OCT-DEC	29	1.1	22.5 10/31	22.1 12/15	16.9 11/30	8.5			96.5
Sharon	2001	OCT-DEC	13	1.6	18.0 12/15	11.9 12/21	11.0 11/21	6.8			92.3
TRNP - SU (Painted Canyon)	2001	OCT-DEC	14	1.7	5.7 12/21	3.6 11/21	3.3 11/15	2.6			85.7

The maximum 24-hour concentration is 23.9 µg/m³ at Fargo NW on 10/31

* The ambient air quality standards are:

FEDERAL Standards -

- 1) 24-hour: 3-year average of 98th percentiles not to exceed 65 µg/m³.
- 2) Annual: 3-year average not to exceed 15 µg/m³.

COMPARISON OF AIR QUALITY DATA WITH
THE NORTH DAKOTA AMBIENT AIR QUALITY STANDARDS *

POLLUTANT : Inhalable PM₁₀ Particulates (µg/m³)

LOCATION	YEAR	SAMPLING PERIOD	NUM OBS	MIN	M A X I M A 24 - HOUR			ARITH MEAN	#>150	AM>50	% >MDV
					1ST MM/DD	2ND MM/DD	3RD MM/DD				
Bismarck Residential	2001	OCT-DEC	15	9.0	39.0 10/04	28.0 11/15	28.0 11/21	19.3			100.0
Dragswolf	2001	OCT-DEC	15	2.3	37.4 10/04	35.9 10/10	30.6 10/16	17.0			86.6
White Shield	2001	OCT-DEC	15	0.6	34.1 10/04	30.3 10/10	24.7 10/16	14.1			86.6

The maximum 24-hour concentration is 39.0 µg/m³ at Bismarck Residential on 10/04

* The STATE and FEDERAL air quality standards are:

- 1) 150 µg/m³ maximum averaged over a 24-hour period with no more than one expected exceedance per year.
- 2) 50 µg/m³ expected annual arithmetic mean.

SECTION THREE

EXCEEDANCE LISTINGS

By Site Date Hour

All Units Are in Parts Per Billion Except Wind Direction (Degrees),
Wind Speed (MPH), CO (PPM), and PM_{2.5} and PM₁₀ (µg/m³)

The * Identifies the Exceedances

NONE

By Date Hour Site

All Units Are in Parts Per Billion Except Wind Direction (Degrees),
Wind Speed (MPH), CO (PPM), and PM_{2.5} and PM₁₀ (µg/m³)

The * Identifies the Exceedances

NONE